EUROPEAN CENTRAL BANK
EUROSYSTEM

Working Paper Series

Simon Savšek

What are the main obstacles to hiring after recessions in Europe?

Wage Dynamics Network

No 2153 / May 2018

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Wage dynamics network

This paper contains research conducted within the Wage Dynamics Network (WDN). The WDN is a research network comprising economists from the European Central Bank (ECB) and the national central banks (NCBs) of the EU countries. It aims to study in depth the features and sources of wage and labour cost dynamics and their implications for monetary policy.

The WDN initially operated from 2006 to 2009 and resumed activities, in part, in 2013. At present, 25 NCBs participate in the WDN, which is chaired by Juan F. Jimeno (Banco de España), with Ana Lamo (ECB) acting as secretary. The WDN's current research focus is to assess labour market adjustments in the period 2010-13 and firms' reactions to the labour market reforms which took place over this period in EU Member States. For this purpose, in 2014 the network launched an ad hoc survey of firms called the "WDN3 survey".

The refereeing of this paper was coordinated by Juan J. Jimeno (Banco de España, chairperson), Jan Babecký (Česká národní banka), Mario Izquierdo (Banco de España), Stephen Millard (Bank of England), Tairi Rõõm (Eestipank), Thomas Mathä (Banque centrale du Luxembourg), and Eliana Viviano (Banca d'Italia)

The paper is hereto released in order to make the results of WDN's research widely available, in preliminary form, to encourage comments and suggestions prior to final publication. The views expressed in the paper are those of the author and do not necessarily reflect those of the ESCB.

Abstract

This paper assesses the relative importance of perceived obstacles to hiring workers on a permanent basis faced by EU firms and studies how they depend on firm's characteristics. Findings suggest that the main obstacles to hiring in Europe are high uncertainty, shortage of skilled labour, high payroll taxes, high wages and the risks associated with changes to labour laws. While negative (firm-level) demand and finance shocks negatively affect firms' perceptions of obstacles to hiring, labour market structures and firms'/employees' characteristics are also found significant. In particular, our analysis shows that firms employing a higher percentage of skilled, permanent and experienced workers report fewer hiring obstacles. In contrast, firms under collective wage bargaining arrangements seem to report these obstacles more often. However, there are also some specific obstacles to hiring where this is not the case, which suggests that firm-level characteristics should also be taken into account when designing labour market policies. Finally, our analysis provides further tentative evidence on the impacts of labour market reforms, which seem to have a potential to address impediments towards employment creation in the EU.

Keywords: labour market, obstacles, employment, structural reforms

JEL classification: D22; J21; J24; J63

Non-technical summary

This paper provides an analytical description of the main hiring obstacles from the firms` perspective in the EU. We exploit the latest dataset of the Wage Dynamics Network (WDN) to investigate these obstacles and examine whether they differ across different types of firms.

The WDN dataset, with about 25,000 firm-level observations from 25 EU countries, offers a unique opportunity to disentangle a number of obstacles to hiring and provides us with a framework to infer about their relative importance. In addition, we can assess the relevance of a given obstacle across different firm types (e.g. in terms of size, workforce composition, shocks faced, etc.) and also understand impacts of labour market reforms on hiring decisions. Overall, uncertain economic conditions are identified as the main obstacle towards hiring, followed by the shortage of skilled labour, high payroll taxes, high wages and the risks associated with changes of labour laws. Limited access to finance, high costs of other inputs and high hiring costs were found to be somewhat less important. However, almost a quarter of firms still reported that limited access to finance was an important obstacle. Furthermore, our results point to a strong cross-country heterogeneity. For example, firms from countries, which were under adjustment programmes or Baltic countries reported hiring obstacles more frequently.

In line with economic theory, our analysis generally shows that (firm-level) shocks negatively affect perceptions on hiring across a number of obstacles. At the same time, firms'/employees' characteristics and labour market structures are also found to be important. In case a firm employs skilled, permanent and experienced workers, the probability of a firm reporting that it had problems with hiring is generally reduced. On the contrary, any type of existing wage bargaining agreement seems to increase this probability. While these results hold across a number of obstacles, they are not a universal finding. For example, the results for the skill shortage obstacle are sometimes reversed. Concretely, the greater the persistence of the demand shock, the higher the probability of a firm stating it had problems in finding the right skills. Furthermore, the probability of identifying the skill shortage as an obstacles increases with higher percentage of skilled and permanent staff.

Our analysis also suggests that labour market reforms have a potential to address impediments towards employment in the EU, but further work is needed to better link micro and macro level evidence on the importance of obstacles to hiring. Finally, while it is clear that our sample is restricted to firms, which have successfully coped with the crisis, obstacles to hiring are even more binding for firms, which were not so successful, and therefore our results need to be interpreted with even greater care for policy considerations.

1. Introduction

Firms face many obstacles to hiring ranging from high uncertainty, rigid institutional set-ups, shortage of skilled labour to unfavourable financial conditions. Uncertainty and persistence of shocks discourage firms to place new investments and thereby limit job creation. Inflexible institutions may also imply high hiring or firing costs. In addition, unions can enter into negations for higher wages making adjustment capacities of firms more limited. Furthermore, skills required to enter the job market might change, implying stricter entering conditions in some professions, compared to the usually more protected incumbents. At the end of very prolonged recessions, even hysteresis effects can start kicking in, crystalizing in a deteriorating quality of the pool of the unemployed. In a nutshell, many factors are at work when studying employment prospects, particularly after deep recessions, which call for further study. In addition - given so many interplaying factors discussed above - what do firm- and employee- characteristics have to say about a particular hiring obstacle? Finally, is there new evidence that labour market reforms facilitated employment creation in Europe after the crisis?

In our paper, we try to explore the roots of the hiring problem in the aftermath of the crisis in Europe. We exploit the Wage Dynamics Network (WDN) third wave questionnaire, which surveyed about 25,000 firms in 25 EU countries to learn about shocks, channels of adjustment, the role of labour market institutions and obstacles to hiring, which we study in this paper.

In particular, we investigate the relative importance of obstacles to hiring workers from the perspective of an EU firm. Overall, uncertain economic conditions are identified as the main obstacle towards hiring, followed by the shortage of skilled labour, high payroll taxes, high wages and the risks associated with changes of labour laws. Limited access to finance, high costs of other inputs and high hiring costs were found to be somewhat less important. However, almost a quarter of firms reported that limited access to finance was an important obstacle. Furthermore, our results point to a strong cross-country heterogeneity. For example, firms from countries, which were under adjustment programmes, or Baltic countries reported hiring obstacles more frequently.

In addition, we assess the likelihood of reporting a given hiring obstacle depending on firms' characteristics. To do so, we augment our regressions with a number of explanatory variables, such as (firm-level) shocks, firms'/employees' characteristics and wage bargaining institutions. Our results show that negative demand and finance shocks and the persistence of demand shocks negatively affect perceptions on obstacles to hiring across a number of obstacles. In addition, smaller firms tend to have more problems with hiring. At the same time, a number of characteristics are also found to be significant after controlling for country- and sector-specific effects. In case a firm employs skilled, permanent and experienced workers, this generally reduces the probability of a firm stating that it had problems with hiring. Furthermore, any type of a wage bargaining agreement seems to increase this probability. While these results holds across a number of obstacles, it is not a universal finding. For example, the results for the skill shortage obstacle are sometimes reversed. Here, the persistence of

negative demand shocks reduces the probability of a firm stating it had problems in finding the right skills, possibly because 'pool of talent' is bigger after persistent shocks. Our results also show that firms with a higher share of skilled and permanent staff are more likely to identify the skill shortage as a problem. This indicates that high-skilled workers are scarcer than low-skilled, while such workers also possess firm-specific human capital and therefore greater bargaining power.

Our analysis also suggests that labour market reforms have the potential to facilitate employment growth in the EU. While the evidence in this section is mainly descriptive, empirical results also suggest that firms, which perceived higher labour market flexibility at the end of recession due to reforms of labour markets, also implied that some particular hiring obstacles were less pronounced.

The paper adds the following contribution to the existing literature. First, our dataset provides a unique opportunity to differentiate across a number of obstacles to hiring at the same time, while in the empirical literature authors usually tackled these one by one. Second, even though obstacles to hiring were listed before in the empirical and theoretical literature, we are among the first ones to provide an assessment of their relative importance. Third, our study tries to bring somewhat closer the qualitative and quantitative sides of employment creation since our survey data also includes information on the composition of the workforce. In particular, we show that shocks, institutions, but also firm-level characteristics, do matter in determining labour market outcomes. Finally, we provide some further tentative evidence on the perceived impacts of labour market reforms in Europe.

The paper is organized as follows. Chapter 2 presents the motivation and existing literature. Chapter 3 describes the data and the methodology. Results of the paper are presented in Chapter 4 and summarized in Chapter 5. Some policy conclusions are also drawn in the final chapter.

2. Motivation and existing literature

The contributions of our paper try to bring a bit closer the two somewhat different sides of labour market studies on employment creation. The first one concerns overall obstacles to hiring and highlights more the quantitative side of employment growth. In this area, the majority of the recent literature focused on the importance of institutional rigidities and shocks for employment outcomes. The second research area investigates deeper the employee and other characteristics in determining these outcomes. In particular, according to the insider-outsider theory, the insiders seem to enjoy more favourable employment opportunities than outsiders. Indeed, there is evidence that employment growth in Europe relies more and more on temporary and fixed-term contracts. These aspects of the literature therefore discuss more the qualitative side of the adjustment. Because our dataset includes several variables on employment composition (such as tenure, type of contract, etc.), we can better control for possible compositional effects and thereby close at least party the gap between the two sides of studies. We provide an incomplete overview of the literature in the following paragraphs, starting with the overall obstacles.

As early as Giersch (1985), who pointed to the 'Eurosclerosis' phenomenon, European countries were seen to be too rigid to cope with severe shocks. The author identified wage rigidity as a key obstacle towards labour market clearing, manifesting in high and persistent unemployment rates. In addition, Barro (1988) named other institutional rigidities, which could have caused the observed persistence in unemployment. These included, for example, high union density or strict employment protection legislation (EPL), which are still very much present across the EU and could significantly affect employment. However, Bertola (1990) argued that job security provisions alone could not be blamed for high unemployment in the European countries.

In view of these findings, research started to focus on interactions between institutions and shocks. This interaction was, for example, studied by Blanchard and Wolfers (2000) in a panel of 20 OECD countries. The authors claimed that the rise in unemployment since the 1960s and also the increased heterogeneity among European countries should be attributed to both, shocks and institutions. The importance of various labour market institutions and shocks for labour market outcomes was also confirmed by rapidly growing micro data studies, including the previous and the current WDN waves. Evidence from Galuscak et al. (2012), Bertola et al. (2012), Fabiani et al. (2015), and Boeri and Jimeno (2016), from WDN1, WDN1, WDN2 and WDN3, respectively, confirms that cross-country differences in Europe, once controlled for shocks, can be to a large extent attributed to different labour market institutions.

While there seems to be an agreement on the importance of labour market institutions for labour market outcomes, there is some disagreement on the implications of particular institutions. In the case of employment protection legislation (EPL), Schivardi and Torrini (2004),[1] for example, show that EPL does influence firm size distribution in Italy, but its effects are quantitatively modest. Additionally, results of Boeri and Jimeno (2005) show that stricter EPL affects negatively job turnover, but even more strongly job destruction. On the other hand, Battisti and Vallanti (2013)[2] do not find significance of the EPL when testing the hypothesis that firing costs are significantly lower in firms that are unaffected by employment protection regulation. As a matter of fact, some papers provide mixed evidence. For example, a paper by Martins (2009) shows that the exemptions from procedural requirements for dismissal in Portugal seem not to have a significant effect on worker flows, however, firm performance seems to improve considerably in firms with lower firing costs, because wages there tend to fall more.

[1] Results are consistent with the ones of Schivardi and Torrini (2008) and Kugler and Pica (2008), who also study the Italian labour market reform that increased firing restrictions for small firms in 1990. In addition, Cingano et al. (2014) show that the increase in hiring costs induced capital deepening and a decline in total factor productivity in small firms, relative to larger firms after this reform. Additionally Mühlemann et al. (2015), show that hiring costs for small firms are associated with labour market tightness in Switzerland. Finally, for the EU-15, Millán et al. (2013) show that strict EPL is negatively related to both hiring and firing decisions for very small firms.

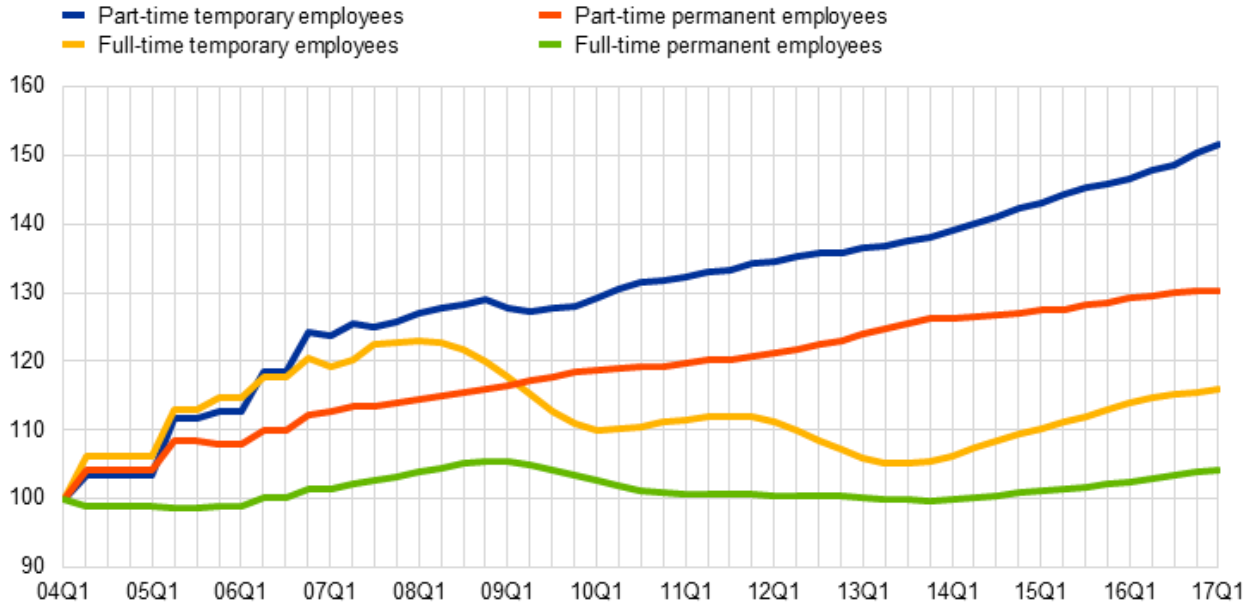
[2] Bauer et al. (2012) also finds insignificant impact of labour market regulations on job creation in Germany.

The impact of the degree of wage bargaining centralisation on employment and wages seem to be even less conclusive. Outcomes seem to be driven by the actual bargaining power of unions and large cross-country differences in institutional set-up, which makes the theoretical predictions less clear. For example, Dustmann et al. (2014) show that sector-level agreements in Germany have allowed differentiated wage setting, thereby supporting employment growth. On the other hand, Martins (2014) shows that the widespread use of extensions of sector agreements negatively affected employment in Portugal.

The second strand of literature focuses more on the quality side of the employment creation. This strand follows more the so-called labour market duality with the insider-outsider theory developed by Lindbeck and Snower (1984, 1988). This literature focuses on the differences in employment and wage opportunities between the insiders, incumbent workers, and outsiders, who are only entering the job market. The former seem to enjoy more favourable employment and wage opportunities than the newcomers.

This theory is also important for current employment developments in the EU. In fact, employment creation in the EU depends more and more on temporary and part-time work in the aftermath of the crisis (see Chart 1). The long-lasting effects of the crisis and high uncertainty could partly explain this phenomenon. At the same time, rigid institutions, particularly high firing or hiring costs, could also shift the burden of adjustment on less stable employment contracts, which we witness today.

Chart 1: Employment dynamics in different segments of labour market in the EU, base 2004Q1=100 (4 quarters moving averages).



Source: Eurostat, Labour Force Survey, Eurostat, author's calculations.

This issue was already investigated to some extent in some firm-level studies. Leonardi and Pica (2007) report no effect of higher EPL reform for Italy on entrants' wages, and decreasing returns to tenure in the first two years. In addition, in another study, Leonardi and Pica (2013) show that the average wage is reduced slightly when EPL is increased, but this difference seems to hide highly heterogeneous effects.

Other studies focused on educational characteristics of workers, which might drive hiring-firing patterns in Europe. A study by Blatter et al. (2012) finds no evidence of a fixed cost component for hiring in Switzerland. Moreover, hiring costs increase with the hiring rate, skill requirements for job applicants and also depend on macroeconomic conditions. Such findings, in fact, highlight the importance of education. In a more recent study by Blatter et al. (2016), substantial and increasing marginal hiring costs are recognized, which can be reduced by internal training, highlighting the importance of training and internal mobility of the workforce. Moreover, Forsythe (2014) finds that during recessions, the probability of being hired falls for younger workers, while for experienced workers it increases, suggesting an age-employment gap in hiring after recessions.

Furthermore, recent WDN papers by Izquierdo et al. (2017) and Izquierdo et al. (2018) argue that workers' and union's behaviour was severely affected by the recent crisis and that employees'/firms' characteristics should be taken into account when studying post-crisis labour market adjustment. Finally, a recent study by Kersic et al. (2017) also investigates obstacles to doing business in Western Balkans and shows that unfair competition from the informal sector is the main hindrance to doing business, although other obstacles also adversely affect firm performance. While the study includes a broader set of possible obstacles, labour market regulations, and even more so access to finance, are also found important, particularly in some countries.

As opposed to the above studies, our paper is the first one to cover a number of aspects of hiring from a single survey questionnaire. The data enables us to distinguish among several obstacles to hiring as perceived by a large number of EU firms. Furthermore, we try to characterize these obstacles with a number of explanatory variables, such as shocks, firms'/employees' characteristics and labour market institutions. By doing so and taking into account at least partly the employment compositional effects, we try to bringing closer the qualitative and quantitative sides of employment creation in Europe. Finally, while our evidence on the impacts of labour market reforms remains incomplete, we see a large discrepancy on hiring obstacles between firms that have perceived labour market conditions to be more flexible compared to all other firms. As a matter of fact, the perceived increase in flexibility is driven by firms in countries where significant labour market reforms were undertaken in the crisis period, highlighting the importance of reforms for labour market adjustment and employment creation in the EU.

3. Data and methodology

The most recent vintage of the WDN dataset was used in this study. The third wave of the survey (WDN3) was undertaken between 2014 and 2015 among the 25 countries participating in the European System of Central Banks and surveyed about 25,000 firms in Europe. The purpose of the survey was to assess how firms adjusted wages and employment to various shocks hitting them during the Great Recession. At the same time, the survey offers a direct reference to changes in the institutional setting and the role of labour market reforms, which took place in EU countries between 2010 and 2013.[3]

The subject of our analysis are obstacles to hiring. To this end, we create a series of dependent variables which follow from the survey question: "*How relevant is each of the following factors as obstacles to hiring workers with a permanent, open-ended contract at the end of 2013?"* Firms were allowed to choose and tick any obstacle listed below and decide whether was either not relevant, of little relevance, relevant or very relevant. Obstacles in the questionnaire included: uncertain economic conditions, shortage of skilled labour, limited access to finance, high firing costs, high hiring costs, high payroll taxes, high wages, risks of labour law changes and high costs of other inputs (see also Table 3). As said, a firm was allowed to choose among a number of possibilities. For convenience, and also to reduce the number of regressions, we merge not relevant/of little relevance and relevant/very relevant categories.

Following the theoretical literature, we use firm level characteristics from the survey to explain the likelihood of reporting a particular obstacle. To this end, we include a number of shocks, firms'/workers' characteristics and wage bargaining set-ups. Table 1 also offers some descriptive statistics of our sample.

Table 1: Summary statistics of the variables used, % of all firms responded to a particular question

Shocks (% of firms experiencing a particular type of a shock)	
Level of demand	
Strong decrease	10
Moderate decrease	27
Unchanged	21
Moderate increase	33
Strong increase	8
Access to external financing	
Strong decrease	7

[3] The survey included firms from manufacturing, energy, construction, trade, market services, and financial intermediation and, for some countries, also non-market services sectors. However, in our sample, we exclude firms with less than 5 employees and firms operating in non-market services to establish homogeneity across countries since these types of firms were sampled only in some countries, bringing our sample to 23,226 firms. More information on the WDN and the latest sample can be found in Izquierdo et. al (2017), where also shocks and their correlations are reported.

Moderate decrease	15
Unchanged	62
Moderate increase	14
Strong increase	2
Volatility/uncertainty of demand	
Strong decrease	7
Moderate decrease	24
Unchanged	42
Moderate increase	22
Strong increase	5
*Persistence of a strong negative demand shock**	
No strong neg. shock.	90
Transitory neg. shock	1
Only partly persistent neg. shock	4
Long-lasting neg. demand shock	5
Firms'/Employees' characteristics (the average share of workers with a particular characteristic)	
Type of the employment contract	
Permanent full-time	78
Permanent part-time	13
Temporary or fixed-term	10
Occupational groups	
Higher skilled, non-manual	26
Lower skilled, non-manual	25
Higher skilled, manual	31
Lower skilled, manual	20
Job tenure	
Below 1 year	11
Between 1 and 5 years	29
More than 5 years	60
Wage bargaining institutions	
Share of firms with any type of a collective pay agreement	55

Source: WDN3, author's calculations. Notes: Some categories do not sum to 100 due to rounding or employment weights, which are used.

**only firms hit by a strong negative demand shock.*

Approximately 35% of firms in the sample reported to have experienced a moderate or strong negative demand shock, and about 20% of firms experienced a moderate or strong negative finance shock. A moderate or strong volatility/uncertainty of demand was reported by about 30% of firms in the survey. Out of those firms, which reported a strong negative demand shock, we also consider the

ones that reported any type of a persistence in the demand shock. A large majority of firms reported no particular persistence, while about 10% of firms reported partly-lasting/long-lasting shock.

Regarding firms'/workers' characteristics, a typical firm in the sample, on average, employs 90% of workers on a permanent basis, a large majority of them on a full-time basis. Others are employed either on a fixed-term or a temporary basis. Almost 60% of workers in a typical firm are skilled and 60% of them have tenure of 5 years or more. In the sample, about 10% of workers are newcomers, i.e. with a less than 1 year of tenure, and about 30% of them have a tenure between 1 and 5 years. Finally, 55% of firms apply some type of a collective bargaining agreement. A final set of explanatory variables is presented in Table 2 below.

Table 2: The final set of explanatory variables included in the model

Explanatory variable	***Type of the explanatory variable***
Shock variables	*Firms hit by a moderate or a strong demand shock, dummy*
	Firms hit by a moderate or a strong finance shock, dummy
	Firms hit by a moderate or strong volatility/uncertainty of demand, dummy
	Firms hit by a less/more persistent negative demand shock
Firms'/workers' characteristics	*% of permanent workers in a firm*
	% of skilled workers in a firm (manual and non-manual - ISCO: 1, 2, 3, 7, 8)
	% of experienced workers in a firm (i.e. tenure more than 5 years)
Wage bargaining institutions	*Firm applied any type of a collective bargaining agreement, dummy*

On the basis of the obtained information, and because our endogenous variables are dummies, equal to unity if the obstacles were found "very relevant" or "relevant" and zero otherwise, we define the following probit model:[4]

$$\text{Prob}(Y=1) = \Phi(\beta`x)$$

Where β is a vector of coefficients, x is a vector of explanatory variables, and $\Phi(.)$ denotes the cumulative normal distribution function.

[4] While the probit model is a standard in the micro applied work and was used also in other works based on WDN surveys (eg. Bertola et al. (2012), Galuscak et al. (2012)), compared to the linear probability model it also ensures that the probability space is restricted between values 0 and 1. To at least partly address sectoral, country and firm-size unobserved heterogeneity, all regressions in the empirical part include country, sectoral and firm-size fixed effects. All regressions also include country group dummies, which follow Izquierdo et al. (2017), to control even more precisely for possible cross-country differences in the economic environment in 2013, such as the state of the business cycle, which might influence our results. As a robustness check, we also performed an ordered probit model estimations, results of which are available in the Table A4 in the Appendix.

4. Results

4.1 Descriptive analysis and theoretical predictions

This section starts with the descriptive analysis of the main variable of interest and continues with theoretical predictions underpinning the empirical part. We summarize the answers of firms in Table 3, corresponding to the prelisted obstacles as being relevant or very relevant.

Table 3: Obstacles to hiring at the end of 2013, % of firms, cross-country results

Country	*Uncertain economic conditions*	*Shortage of skilled labour*	*Limited access to finance*	*High firing costs*	*High hiring costs*	*High payroll taxes*	*High wages*	*Risks of labour law changes*	*High cost of other inputs*
AT	26	38	5	18	8	32	31	15	15
BE	77	74	23	63	44	75	73	54	36
BG	76	65	55	43	43	72	63	60	55
CY	80	23	40	28	17	44	34	20	26
CZ	66	60	39	56	30	64	42	39	33
DE	39	61	10	24	18	34	41	26	9
EE	62	90	46	36	36	81	81	38	46
ES	72	37	36	59	37	63	61	42	38
FR	91	75	24	58	34	81	48	63	45
GR	73	28	41	29	18	50	18	32	30
HR	77	58	48	59	49	71	44	61	63
HU	41	17	12	14	13	33	24	20	18
IE	74	57	39	36	37	66	64	39	37
IT	82	33	39	64	37	84	32	55	42
LT	59	77	17	50	39	81	73	44	32
LU	67	68	21	39	28	34	65	36	28
LV	65	85	63	46	35	74	76	44	41
MT	51	70	20	23	31	28	57	30	33
NL	79	43	25	44	18	39	49	40	20
PL	86	71	51	73	69	85	76	69	59
PT	83	42	35	66	46	65	44	55	49
RO	63	61	30	32	38	68	48	49	44
SI	79	49	47	53	46	78	43	49	37
SK	72	71	54	65	35	77	59	72	57
UK	41	59	13	17	23	30	37	22	19
Total	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Source: WDN3 data, author's calculations. Notes: employment-weighted figures.

Uncertain economic conditions are the main obstacle to hiring employees. On average, 62% of firms in the survey reported that high uncertainty affects their hiring decisions and ranges from 26% in Austria to 91% in France. The second most relevant obstacle is the shortage of skilled labour. As many as 90% of firms in Estonia report it as an obstacles, while only 17% of firms in Hungary find it relevant or very relevant. EU average stands at 57%. The following obstacles follow in terms of EU averages: high payroll taxes (55%), high wages (46%), high firing costs (41%) and the risks associated with changes of labour laws (40%). Limited access to finance (24%), high costs of other inputs (29%) and high hiring costs (30%) were found to be somewhat less important.

However, overall results mask important cross-country heterogeneity. One thing a careful reader should observe is that firms from stressed and some Eastern-European and Baltic economies reported obstacles much more often than firms from non-stressed economic environments. For example, even in terms of access to finance, more than 60% of firms from Latvia said this was an important obstacle, whereas only 5% of firms from Austria reported this factor as an issue. There is also some evidence on sectoral and firm-size heterogeneity, which we report in the Annex (Tables A1 and A2, respectively). For example, smaller firms tend to report, on average, more obstacles to hiring. A similar conclusion can be also established for firms operating in the construction sector.

Several theoretical predictions on how our explanatory variables should impact the hiring obstacles can be postulated. Firstly, we expect that firms, which experienced negative and persistent shocks will, on average, be more likely to report each of the obstacles to hiring. The recession made such firms more vulnerable, which implies less hiring. Secondly, firms that use any type of collective bargaining agreement are more limited in determining wages, possibly shifting adjustment burden also on the other margins (see Hantzsche et al., 2018). Third, regarding employees'/firms' characteristics, ex-ante one could expect that bigger firms have more internal adjustment possibilities, such as reshuffling workers or covering for the absence of workers. Bigger firms are therefore expected to signal fewer obstacles to hiring. Regarding the tenure, skills and type of contract, the answer is less obvious. On the one hand, tenured, skilled and permanent workers are expected to have more experience and possess firm-specific human capital, which would increase the value of the firm. Therefore, such characteristics ought to flag more successful firms, which should, in turn, have fewer obstacles to hiring. On the other hand, these characteristics also imply increased bargaining power of employees, manifesting in pressures for higher wages and more protection, as the firm cannot simply find replacements. It might also be the case that result depends on the particular obstacle to hiring, as some of them are driven by cost considerations (high wages, high taxes…), some by the demand-side (uncertainty, access to finance) and some by the supply-side (skill shortage) considerations.

4.2 Empirical results

In this section, we employ probit models to test for the significance of the above-mentioned explanatory variables, across a number of hiring obstacles, thereby providing a meaningful economic interpretation of our descriptive analysis.

As our baseline results show, shocks seem to be very important in characterizing various obstacles to hiring. In line with the literature review, shocks were also driving other adjustment margins in the WDN3 wave (see Izquierdo et al., 2017). Indeed, firms hit by negative demand or finance shocks are much more likely to report obstacles to hiring (Table 4). A similar conclusion can be established also for firms facing a higher persistence of a negative demand shock.

Table 4: Baseline probit regressions

Explanatory variables	Obstacles to hiring								
	Risks of labour laws being changed	Insufficient access to finance	Insufficient availability of labour with the required skills	Uncertain economic conditions	High firing costs	High hiring costs	High payroll taxes	High wages	Costs of other inputs
Negative demand shock	0.03636***	0.02047**	-0.00751	0.14104***	0.06043***	0.02528***	0.06372***	0.05405***	0.02880***
	(4.139)	(2.479)	(-0.837)	(17.339)	(6.802)	(3.069)	(7.414)	(6.067)	(3.379)
Negative finance shock	0.08874***	0.32081***	0.03374***	0.10980***	0.11758***	0.10177***	0.11920***	0.10267***	0.12139***
	(9.475)	(35.430)	(3.549)	(12.444)	(12.367)	(11.465)	(13.125)	(10.857)	(13.260)
Volatility of demand	0.02095	0.02255	0.00059	0.08831***	0.04041**	0.00579	0.02573	0.01334	0.01703
	(1.118)	(1.257)	(0.031)	(4.755)	(2.066)	(0.324)	(1.382)	(0.694)	(0.929)
Persistence of a negative demand shock	0.00619	0.01007**	-0.01817***	0.03867***	0.01802***	-0.00046	0.01381***	0.01605***	0.00265
	(1.270)	(2.263)	(-3.635)	(6.964)	(3.618)	(-0.103)	(2.713)	(3.196)	(0.573)
Share of permanent employees	-0.00100***	-0.00062***	0.00062***	-0.00177***	-0.00127***	-0.00036*	0.00025	-0.00016	-0.00051***
	(-4.843)	(-3.197)	(2.919)	(-8.303)	(-5.820)	(-1.844)	(1.241)	(-0.781)	(-2.585)
Share of skilled employees	-0.00054***	-0.00013	0.00066***	0.00014	-0.00037***	-0.00006	-0.00040***	-0.00011	-0.00024**
	(-4.356)	(-1.143)	(5.185)	(1.182)	(-2.985)	(-0.563)	(-3.241)	(-0.871)	(-2.002)
Tenure of employees: more than 5 years	-0.00032**	-0.00044***	-0.00163***	0.00052***	0.00019	-0.00063***	-0.00043***	-0.00080***	-0.00034**
	(-2.296)	(-3.331)	(-11.234)	(3.921)	(1.353)	(-4.801)	(-3.057)	(-5.624)	(-2.548)
Any bargaining agreement	0.03167***	-0.00616	0.03506***	0.02078**	0.03951***	0.01082	0.02999***	0.02649***	0.01684*
	(3.244)	(-0.666)	(3.526)	(2.291)	(3.971)	(1.167)	(3.155)	(2.678)	(1.760)
Country, size and sectoral fixed effects, as well as country group dummies, included	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	19,233	19,234	19,344	19,383	19,308	19,292	19,360	19,301	18,821

*Source: WDN3, author's calculations. Notes: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, marginal effects at mean reported, unweighted regressions.*

Volatility/uncertainty of demand seems not to play such a significant role for a large majority of obstacles. However, this characteristic increases the probability that a firm suggests uncertain economic conditions and firing costs as an obstacle to hiring. This is not surprising, as the measure of uncertainty of demand is very closely linked to the uncertainty obstacle. At the same time, it seems that high demand volatility induces the possibility of additional firing costs.

Moving towards firms`/employees` characteristics, firms employing a higher percentage of skilled, permanent and experienced employees generally experience decreased probability of hindrances towards hiring. These results provide evidence that this workforce composition flags the more productive and successful firms, which face fewer obstacles to hiring, in line with our predictions.

However, in case of skill shortages, the higher share of skilled and permanent workers seems to increase the probability of a firm reporting this specific obstacle. It appears likely that skilled and permanent workers possess more negotiating power, such that their retention, especially in smaller firms, is very difficult. On the other hand, the high-skilled workers are also scarcer and more difficult to attract than the low-skilled.

Higher tenure of workers usually decreases the probability of obstacles to hiring. In case stable long-term working practices are prevalent in the firm, hiring on a more permanent basis seems to be less of an obstacle. However, under uncertain economic conditions, this probability changes sign. Stable, long-term working relations might be put to the test in highly uncertain economic conditions, with the firm possibly preferring more flexibility in such times. Interestingly, in cases where firms report high firing costs obstacles, tenure is not statistically significant.

In line with our predictions, wage bargaining agreements seem to increase the probability of a firm reporting hindrances to hiring across many obstacles. This is not surprising, given wage bargaining agreements lead to trade-offs between the employment and wage adjustment margins, at least to some extent, and therefore higher rigidity on one margin could shift the adjustment burden on the other (see Hantzsche et al. 2018).

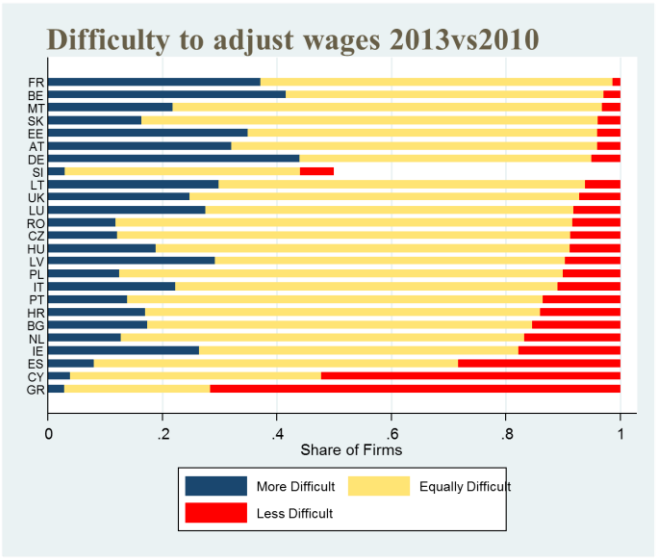
Because our main question relates to the obstacles of hiring on open-ended contracts at the end of recessions, it might be valuable to check whether hiring decisions between 2010 and 2013 influence our results. To investigate this, and also to perform another robustness check of our baseline results, we add additional explanatory variable to our regressions. In this case, the dummy variable takes value 1 if a firm decreased permanent employment in 2010-13, and zero otherwise (i.e unchanged or increased permanent employment). While the baseline results of our analysis remain valid, it is interesting to observe that it is not uniformly true that firms, which were downsizing during the crisis and were potentially more vulnerable, also reported higher obstacles to hiring in the aftermath of the recession. While this is true for the majority of obstacles in the segment of costs considerations (high firing costs, high taxes and high wages) as well as for the uncertain economic conditions and access to finance, the opposite is true for the skill shortage obstacle (see full results in Table A3 in the Appendix). Downsizing in the less productive segments of labour force during the crisis might have created hiring space for more skilled workers in the aftermath of the crisis, with the crisis acting as a catalyst.

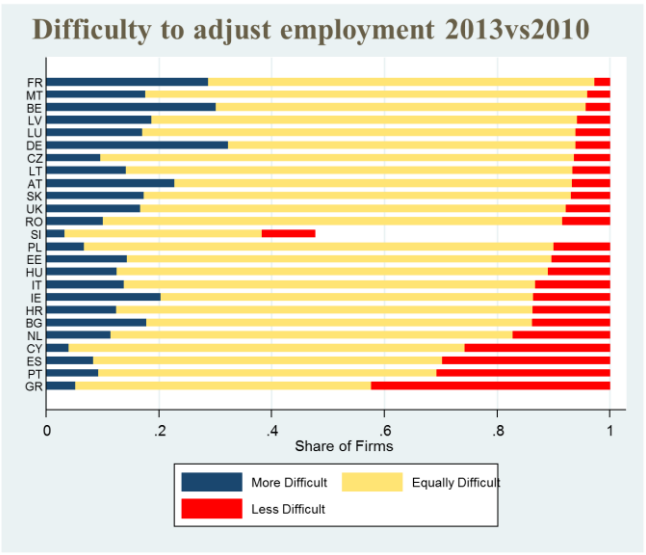
4.3 Does the increased flexibility help to reduce obstacles to hiring? The role of labour market reforms in facilitating labour market adjustment and hiring

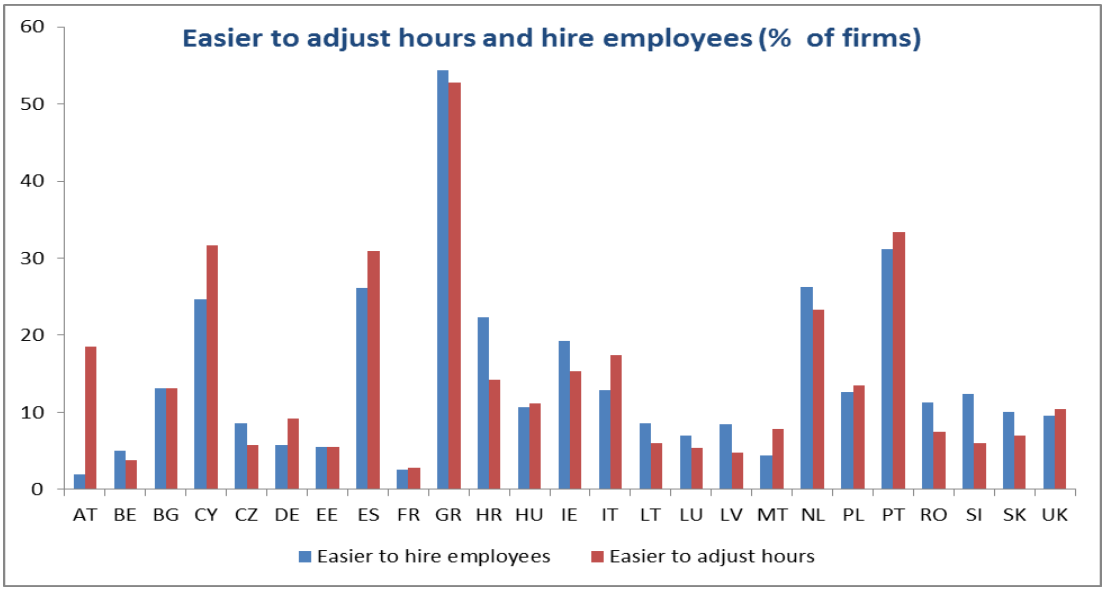
To motivate this section, we start with some observations and descriptive charts from the WDN3 survey on the ease of adjustment as reported by EU firms. As presented recently in papers by Izquierdo et al. (2017) and Izquierdo et al. (2018), a number of firms in the WDN3 survey reported that it was easier to adjust labour inputs or wages compared to the pre-crisis period (Chart 2).

The percentage of firms that reported the labour market being more prone to adjustment in the post-crisis period is particularly high in countries where significant changes to labour market and its structures took place. For example, more than 50% of firms in Greece report that adjusting wages, hiring employees or adjusting working hours was easier in the aftermath of the crisis compared to 2010. Higher percentages are also visible in other reforming countries, such as Spain, Cyprus and Portugal. At the same time, there is a significant number of companies, particularly from the non-stressed countries such as Belgium, France, Malta, Lithuania, Latvia, Germany, Czech Republic or Luxembourg, where no changes or even less flexible labour market settings were identified in the aftermath of the crisis.

Chart 2: The ease of adjusting across a number of channels, 2013 in comparison to 2010



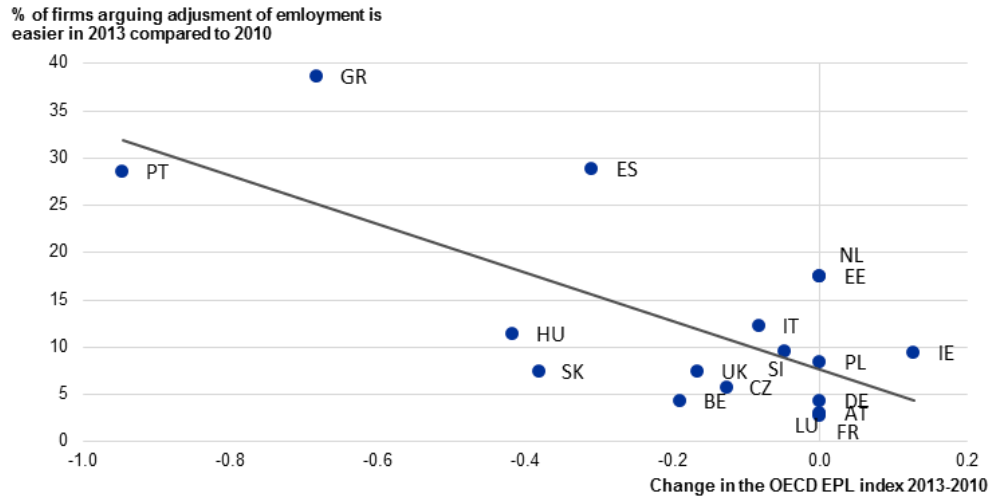




Source: Izquierdo et al. (2017) and Izquierdo et al. (2018) based on the WDN3 data. Notes: In the Slovenian questionnaire, the question included an extra option and therefore results are not fully comparable. In charts with perceptions about employment and wage adjustments, the average proportion of firms across all the employment adjustment and wage adjustment channels is taken as a summary measure. For more details, refer to the papers quoted.

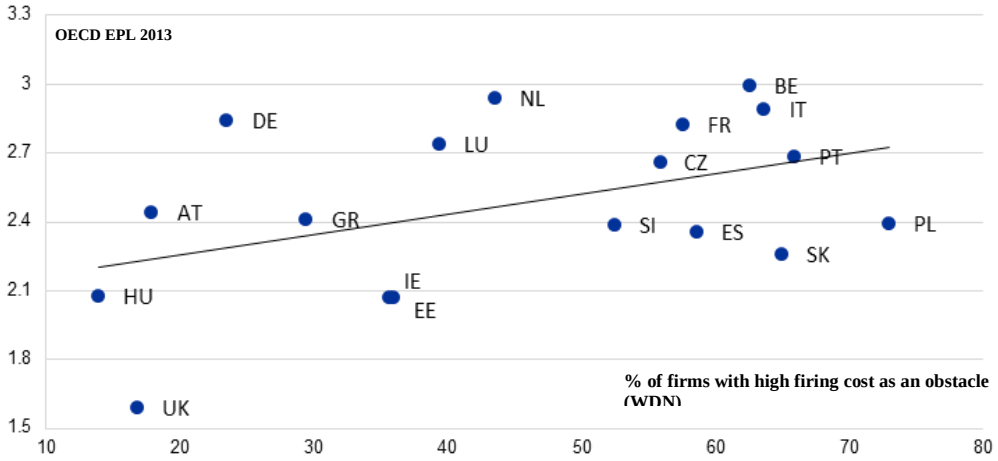
For firms, where adjustment was easier, Izquierdo et al. (2018) identify reforms in labour markets as the driver behind the perceived changes. For example, Chart 3 shows that changes in the employment protection legislation (EPL) index associate nicely with the WDN indicator, which corresponds to the percentage of firms responding that adjusting the labour input was easier in 2013 than in 2010. In addition, Chart 4 shows that high costs of firing reported as an obstacle, which we use in our regressions, also associates nicely with the EPL index.

Chart 3: Reforms indicator (EPL) and the ease of adjusting labour input (WDN3)



Source: Izquierdo et al. (2017) and Izquierdo et al. (2018), based on the OECD and WDN3

Chart 4: High firing cost as an obstacle and the EPL index



Source: OECD, WDN3, author's calculation.

Note: The vertical axis displays the degree of protection of permanent workers against individual dismissals as measured by the OECD EPL index; the horizontal axis displays the importance of high firing costs as an obstacle to hiring (in % of firms, employment weighted) across EU countries.

Finally, recent WDN3 evidence also suggests that labour market reforms were accompanied by changes in workers' and unions' behaviour. It seems that during a deep crisis, workers and unions are more prone to adjustment, with workers willing to accept lower wages and less stable employment

relations as compared to the pre-crisis period. All this information needs to be carefully considered, as it will likely influence our results on obstacles to hiring.

To address this question, we augment our regressions for high firing costs, high hiring costs and high wages obstacles with an additional explanatory variable. In particular, we include dummy variables that take value 1 if a firm perceived it is (much) easier to lay-off employees individually due to reforms, (much) easier to hire employees due to reforms and (much) easier to adjust wages of new hires due to reforms, and zero otherwise, separately to the three corresponding regressions on obstacles. This is only done for those obstacles, where comparability with the reform measure is straightforward.

The results[5] in Table A5 in Annex show that firms, which reported that labour market reforms were the underlying reason for increased flexibility were less likely to report some of the hiring obstacles. In all three regressions, the new dummy variables, capturing labour market reforms, come out as highly significant and negatively signed. While perceptions and actions of firms should not be confused and, therefore, the interpretation of results should remain in terms of associations, perceptions on increased flexibility due to reforms seem to importantly diminish hiring obstacles in Europe.

5 Conclusion and policy implications

The WDN3 survey revealed numerous obstacles to hiring across EU countries. Overall, our results show that uncertain economic conditions are the most important obstacle, followed by the shortage of skilled labour, high payroll taxes, high wages and risks of labour law changes. We observe substantial cross-country heterogeneity of hiring obstacles across countries, while for the sectoral composition there is less of a discrepancy. Smaller firms tend to have more problems with hiring.

We argue that firms' and employees' characteristics need to be carefully considered. This is based on a number of factors, which were influencing labour market dynamics during and in the aftermath of the crisis, ranging from shocks, structural reform to changes in behaviour of unions and workers. In line with theory, negative demand and finance shocks negatively affect firms' perceptions of obstacles to hiring. Additionally, our analysis generally shows that a higher percentage of skilled, permanent and experienced workers reduce the probability of a firm declaring it had problems when hiring, while the existence of collective wage bargaining arrangements appear to increase it. However, this is not the case when considering the insufficient supply of skilled labour as an obstacle. In this particular case, the strong persistence of negative demand shocks actually reduces the probability of a firm

[5] Unfortunately, the results of the analysis in this section are not directly comparable to the previous ones because the question on drivers of perceptions was a non-core question in the questionnaire. This implies that only a few countries (EE, ES, GR, HR, HU, IT, LU, PL, RO) asked this question in the survey, which drastically reduces the sample size, which now includes only about 2000 observations. These results need to be therefore interpreted with additional care.

stating it has problems in finding the right skills. Furthermore, high percentage of skilled and permanent staff employed by a firm, seems to increase the probability of reporting this obstacles as being important.

Our empirical analysis confirms that firms that have stated that the labour market is nowadays more flexible from hiring, firing and adjusting wages perspective, also perceived these particular hiring obstacles as less binding. While due to the restricted sample the results should be interpreted with a greater caution, this finding suggests that labour market reforms have the potential to address the hiring impediments via a number of channels.

Regarding policy prescriptions, overall there ought to be an element of caution given the difference in the institutional set-up across EU countries. From our results, it follows that structural policies should be credible in order to reduce uncertainty. Second, reducing skill-mismatches has been an outstanding issue for many years in Europe. Therefore, education, training and active labour market policies appear to be crucial to equip workers with the right skills, both if they are new entrants to the labour market or re-joining following inactivity or unemployment. Finally, further research is warranted in order to study the appropriate flexibility/job security trade-off, taking into account the various institutional settings across the EU.

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Annex

Table A1: Obstacles to hiring at the end of 2013, cross-sectoral results

Obstacles in hiring permanent employees , Nb. of firms answered relevant/very relevant as a % of all									
Sector	*Uncertain economic conditions*	*Shortage of skilled labour*	*Limited access to finance*	*High firing costs*	*High hiring costs*	*High payroll taxes*	*High wages*	*Risks of labour law changes*	*High cost of other inputs*
Manufacturing	65	57	23	42	28	56	45	40	30
Electricity, gas	53	56	35	35	35	49	42	41	30
Construction	69	66	34	46	30	65	51	46	36
Trade	64	57	25	42	33	58	44	41	32
Business services	60	57	23	40	30	53	47	40	28
Financial intermediation	40	43	12	19	23	29	38	23	14
TOTAL	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Source: WDN3, author's calculations. Notes: employment-weighted

Table A2: Obstacles to hiring at the end of 2013, firm-size results

Obstacles in hiring permanent employees , Nb. of firms answered relevant/very relevant as a % of all									
Firm size	*Uncertain economic conditions*	*Shortage of skilled labour*	*Limited access to finance*	*High firing costs*	*High hiring costs*	*High payroll taxes*	*High wages*	*Risks of labour law changes*	*High cost of other inputs*
1-5 employees	70	57	34	46	34	65	54	48	35
20-49 employees	64	60	27	43	32	60	47	42	32
50-199 employees	66	62	23	43	31	60	48	45	31
200 + employees	56	53	20	37	27	47	41	35	26
TOTAL	**62**	**57**	**24**	**41**	**30**	**55**	**46**	**40**	**29**

Source: WDN3, author's calculations. Notes: employment-weighted

Table A3: Probit regressions, including 2010-13 permanent employment evolution dummy variable to the baseline

Explanatory variables	Obstacles to hiring								
	Risks of labour laws being changed	Insufficient access to finance	Insufficient availability of labour with the required skills	Uncertain economic conditions	High firing costs	High hiring costs	High payroll taxes	High wages	Costs of other inputs
Negative demand shock	0.03718***	0.01257	-0.00116	0.12718***	0.05144***	0.02610***	0.05765***	0.04987***	0.02764***
	(4.137)	(1.490)	(-0.127)	(15.281)	(5.657)	(3.101)	(6.550)	(5.480)	(3.169)
Negative finance shock	0.08905***	0.31810***	0.03611***	0.10531***	0.11431***	0.10208***	0.11718***	0.10123***	0.12095***
	(9.480)	(35.035)	(3.788)	(11.873)	(11.981)	(11.465)	(12.853)	(10.670)	(13.170)
Volatility of demand	0.02109	0.02150	0.00179	0.08676***	0.03877**	0.00591	0.02440	0.01249	0.01684
	(1.125)	(1.197)	(0.094)	(4.675)	(1.980)	(0.331)	(1.309)	(0.650)	(0.920)
Persistence of a negative demand shock	0.00652	0.00701	-0.01558***	0.03265***	0.01431***	-0.00014	0.01120**	0.01436***	0.00219
	(1.321)	(1.555)	(-3.080)	(5.826)	(2.836)	(-0.031)	(2.177)	(2.822)	(0.468)
Share of permanent employees	-0.00100***	-0.00062***	0.00062***	-0.00178***	-0.00127***	-0.00036*	0.00025	-0.00017	-0.00051***
	(-4.843)	(-3.209)	(2.927)	(-8.362)	(-5.843)	(-1.844)	(1.227)	(-0.792)	(-2.587)
Share of skilled employees	-0.00054***	-0.00013	0.00066***	0.00014	-0.00037***	-0.00006	-0.00040***	-0.00011	-0.00024**
	(-4.355)	(-1.142)	(5.180)	(1.200)	(-2.984)	(-0.563)	(-3.240)	(-0.869)	(-2.005)
Tenure of employees: more than 5 years	-0.00032**	-0.00051***	-0.00157***	0.00040***	0.00011	-0.00063***	-0.00048***	-0.00084***	-0.00035***
	(-2.230)	(-3.837)	(-10.776)	(2.989)	(0.790)	(-4.715)	(-3.399)	(-5.837)	(-2.601)
Any bargaining agreement	0.03177***	-0.00718	0.03581***	0.01837**	0.03847***	0.01091	0.02911***	0.02590***	0.01668*
	(3.253)	(-0.774)	(3.599)	(2.022)	(3.865)	(1.176)	(3.061)	(2.618)	(1.744)
Firms decreasing permanent employment between 2010-13	**-0.00402**	**0.03873*** **	**-0.03183*** **	**0.07151*** **	**0.04494*** **	**-0.00396**	**0.03050*** **	**0.02072** **	**0.00554**
	(-0.431)	**(4.451)**	**(-3.340)**	**(7.995)**	**(4.718)**	**(-0.454)**	**(3.276)**	**(2.176)**	**(0.617)**
Country, size and sectoral fixed effects, as well as country group dummies, included	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	19,233	19,234	19,344	19,383	19,308	19,292	19,360	19,301	18,821

*Source: WDN3, author's calculations. Notes: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, marginal effects at mean reported, unweighted regressions.*

Table A4: Ordered probit regressions

Explanatory variables	Obstacles to hiring								
	Risks of labour laws being changed	Insufficient access to finance	Insufficient availability of labour with the required skills	Uncertain economic conditions	High firing costs	High hiring costs	High payroll taxes	High wages	Costs of other inputs
Negative demand shock	0.10584***	0.08980***	-0.01142	0.35943***	0.15980***	0.08547***	0.15783***	0.13993***	0.08024***
	(5.771)	(4.753)	(-0.625)	(19.160)	(8.643)	(4.654)	(8.466)	(7.598)	(4.283)
Negative finance shock	0.25577***	0.78758***	0.13460***	0.30704***	0.29056***	0.30695***	0.31409***	0.29372***	0.31521***
	(13.082)	(37.946)	(6.894)	(15.206)	(14.715)	(15.503)	(15.766)	(14.984)	(15.735)
Volatility of demand	0.06370	0.04838	0.02034	0.28360***	0.10112**	0.02051	0.07207*	0.05715	0.04174
	(1.584)	(1.146)	(0.512)	(6.409)	(2.431)	(0.511)	(1.787)	(1.404)	(1.008)
Persistence of a negative demand shock	0.01914*	0.02379**	-0.03188***	0.15488***	0.04631***	0.01032	0.05280***	0.03594***	0.01429
	(1.813)	(2.186)	(-3.050)	(13.359)	(4.372)	(0.987)	(4.901)	(3.436)	(1.335)
Share of permanent employees	-0.00122***	-0.00114**	0.00166***	-0.00417***	-0.00238***	0.00007	0.00088*	0.00037	-0.00026
	(-2.768)	(-2.502)	(3.742)	(-8.844)	(-5.275)	(0.162)	(1.936)	(0.819)	(-0.573)
Share of skilled employees	-0.00097***	-0.00012	0.00141***	0.00041	-0.00076***	-0.00003	-0.00091***	-0.00008	-0.00044
	(-3.669)	(-0.439)	(5.337)	(1.536)	(-2.885)	(-0.130)	(-3.400)	(-0.317)	(-1.643)
Tenure of employees: more than 5 years (%)	-0.00156***	-0.00173***	-0.00406***	0.00122***	-0.00042	-0.00234***	-0.00150***	-0.00249***	-0.00155***
	(-5.097)	(-5.498)	(-13.281)	(3.946)	(-1.368)	(-7.493)	(-4.851)	(-8.173)	(-4.939)
Any bargaining agreement	0.08390***	0.00761	0.09144***	0.04182**	0.07876***	0.04901**	0.05843***	0.06863***	0.05220**
	(4.094)	(0.363)	(4.534)	(2.063)	(3.859)	(2.390)	(2.918)	(3.393)	(2.546)
Country, size and sectoral fixed effects, as well as country group dummies, included	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	19,233	19,234	19,344	19,383	19,308	19,292	19,360	19,301	18,821

*Source: WDN3, author's calculations. Notes: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, ordered probit coefficients reported, unweighted regressions.*

Table A5: Perceptions on reforms and their impact on obstacles, probit regressions

Explanatory variables	Obstacles to hiring		
	High firing costs	High hiring costs	High wages
Negative demand shock	0.06279**	0.03433	0.09171***
	(2.534)	(1.477)	(3.697)
Negative finance shock	0.07825***	0.10839***	0.09315***
	(3.333)	(4.429)	(3.764)
Volatility of demand	-0.04049	-0.08971*	-0.03315
	(-0.806)	(-1.781)	(-0.649)
Persistence of a negative demand shock	0.02123*	-0.00627	0.00241
	(1.825)	(-0.521)	(0.195)
Share of permanent employees	-0.00107**	-0.00095*	0.00077
	(-2.102)	(-1.850)	(1.415)
Share of skilled employees	-0.00025	-0.00009	-0.00037
	(-0.725)	(-0.279)	(-1.043)
Tenure of employees: more than 5 years	-0.00052	-0.00085**	-0.00058
	(-1.385)	(-2.359)	(-1.478)
Any bargaining agreement	0.00381	-0.02981	0.09691***
	(0.131)	(-1.175)	(3.288)
Reform variable	**-0.11162*** **	**-0.13435*** **	**-0.11633*** **
	(-4.505)	**(-4.849)**	**(-3.854)**
Country, size and sectoral fixed effects, as well as country group dummies, included	**yes**	**yes**	**yes**
Observations	2,597	2,849	2,516

*Source: WDN3, author's calculations. Notes: robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, marginal effects at mean reported, unweighted regressions. The reform variable, which is added separately to a regression, indicates a dummy that takes value 1 if a firm perceived it is (much) easier to lay-off employees individually due to reforms, (much) easier to hire employees due to reforms and (much) easier to adjust wages of new hires due to reforms, and zero otherwise.*

Acknowledgements

I would like to thank Ana Bairrao, Brian Hallissey, Gian Marco Pinna and Dora Kosma for their help and suggestions. I am also thankful to António Dias Da Silva, Srečko Zimic, Reuben Ellul and Matic Petriček, as well as to participants of the WDN3 network and the anonymous referee, for their useful comments. The opinions expressed are mine and do not reflect views of the ECB or the EIB, where I have been employed during the production of this paper. Any remaining errors are the sole responsibility of the author.

Simon Savšek
European Investment Bank, Luxembourg, Luxembourg; email: s.savsek@eib.org

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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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PDF ISBN 978-92-899-3258-5 ISSN 1725-2806 doi: 10.2866/06971, QB-AR-18-033-EN-N